

GOVERNMENT/INDUSTRY AERONAUTICAL CHARTING FORUM
Instrument Procedures Group
May 1, 2007
HISTORY RECORD

FAA Control # 07-01-274

Subject: AIM Information Regarding ODP Minimum Crossing Altitudes

Background/Discussion: The AIM contains language about altitude restrictions that could compromise obstacle clearance on an ODP with an "at or above" altitude restriction. The pertinent AIM language is:

AIM 5-2-7-d 7.

"If an altitude to 'maintain' is restated, whether prior to departure or while airborne, previously issued altitude restrictions are canceled, including any DP altitude restrictions if any."

Climbing crossing altitude restrictions in ODPs are for the sole purpose of providing obstacle clearance. ATC cannot cancel such restrictions when a pilot is using an ODP. ATC can cancel such restrictions on a SID, provided the restriction on the SID is for air traffic purposes rather than obstacle clearance.

Recommendations: The cited AIM language be changed to read:

"If an altitude to 'maintain' is restated, whether prior to departure or while airborne, previously issued altitude restrictions contained in a SID are canceled. This does not include any 'at or above' altitude restrictions in an ODP; those restrictions in an ODP cannot be cancelled"

Comments: This recommendation affects the Aeronautical Information Manual and related directives to ATC personnel.

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Date: April 5, 2007

Initial Discussion Meeting 07-01: New Issue presented by Rich Boll, NBAA, regarding AIM language relating to ODP altitude restrictions. The current AIM language in paragraph 5-2-7-d-7 relates to altitude restrictions on “any DP”. NBAA is concerned that since climbing crossing altitude restrictions in ODPs are for the sole purpose of providing obstacle clearance, ATC cannot cancel such restrictions when a pilot is using an ODP whether the ODP was assigned by ATC or elected by the pilot. ATC can cancel such restrictions on a SID, provided the restriction on the SID is for air traffic purposes rather than obstacle clearance. Paul Ewing stated that if the pilot had questions regarding an ATC clearance, he/she should advise ATC. Al Herndon, MITRE/CAASD, noted that the PARC Pilot/controller Procedures and Phraseology Working Group is working on definition and use of the word “maintain”, which will be coordinated through ATPAC for eventual revision to the AIM and Order 7110.65. Tom Schneider, AFS-420, agreed to have AFS-420, as the OPR for AIM paragraph 5-2-7, review current guidance and update it as required. **ACTION: AFS-420.**

MEETING 07-02: Tom Schneider, AFS-420, briefed that new AIM language was developed in concert with AFS-410 and NBAA and has been submitted for publication in February, 2008. The change revises paragraphs 5-2-7-e-7, to emphasize “ATC” altitude restrictions, and 5-2-7-e-8, to emphasize application to SIDs only, as follows (revised/added text is shown in red):

5-2-7, e 7. If an altitude to “maintain” is restated, whether prior to or after departure, previously issued “ATC” altitude restrictions are cancelled. All minimum crossing altitudes which are not identified on the chart as ATC restrictions are still mandatory for obstacle clearance. If an assigned altitude will not allow the aircraft to cross a fix at the minimum crossing altitude, the pilot should request a higher altitude in time to climb to the crossing restriction or request an alternate routing. ATC altitude restrictions are only published on SIDs and are identified on the chart with “(ATC)” following the altitude. When an obstruction clearance minimum crossing altitude is also published at the same fix, it is identified by the term “(MCA)”.

5-2-7-e-8: Change “DP” to read “SID” in lines 3, 6, and 14.

Rich Boll, NBAA reminded the group that both ODPs and SIDs are designed based on all engines operating. He used the Teterboro 5 ODP as an example of a procedure where ATC sometimes holds aircraft at an altitude below what is specified on the chart. Bill Hammett, AFS-420 (ISI), noted that the Teterboro 5 does not comply with policy as radar is not authorized as a navigation source for ODPs. Ted Thompson, Jeppesen, stated that there have been many concerns with this DP; however, re-design is pending re-configuration of the New York Terminal airspace. During discussion, it was agreed that the AIM material closes one portion of the issue; however, Air Traffic must ensure controllers are aware that they cannot hold aircraft below an obstacle clearance crossing altitude. The newly formed System Operations Planning and Procedures Group, AJR-5000, has the IOU to ensure controller training material regarding altitude restrictions on ODPs is developed. **ACTION: AJR-5000.**

MEETING 08-01: Bill Hammett, AFS-420 (ISI), stated that the AIM change briefed at the last meeting was published in the February 2008 AIM. Tom Schneider, AFS-420, briefed that subsequent to the last meeting, his office has received several inquiries regarding charting dual altitude restrictions at the same fix on SIDs. Tom went on to add that there has been a requirement to annotate both "ATC" and obstruction crossing "MCA" altitudes on SIDs since Order 8260.46A was published on 10/16/00. Bill briefed this requirement arose from ACF issue # 92-02-103, submitted by ALPA regarding the GABRE SID at KLAX. Controllers were routinely holding aircraft down and vectoring departures off the SID, then advising the pilot to re-join the SID and disregard the 11,000 restriction at GABRE. The 11,000 restriction was for ATC purposes; however, ALPA pointed out that approximately 9,300' was required for obstruction clearance. This fact was unknown to the pilot who was at the mercy of ATC monitoring to ensure obstruction clearance. The ACF recommendation was to publish a MCA on SIDs when required for obstruction clearance to provide pilot awareness of underlying obstructions. This was the basis for the 8260.46 policy change and subsequent charting of an MCA at GABRE. Kevin Comstock, ALPA, stated that the language in Order 7110.65, paragraph 4-2-5, and AIM paragraph 4-4-10-g, should be revised so that it is consistent with AIM paragraph 5-2-8-e-7 - not allowing MCA altitudes to be cancelled by controllers. Brad Rush, AJW-321, stated that MCA is an en route term and should not be used on other than en route airways. Bill responded that although the Pilot/Controller Glossary definition of MCA refers to en route operations, it should be understood that the meaning is applicable wherever used. The MCA flag icon is also described in the Terminal Procedures Publication (TPP) legend page for SIDs and STARs. The MCA flag has been on the GABRE SID for years and the "(MCA)" annotation has been on the ZEFFR SID for quite some time. James Taylor, AFFSA, stated that all published altitude restrictions should be considered mandatory unless removed by the controller. Richard Kagehiro, AJE-31, recommended that changes to Order 8260.46 be held in abeyance until ATC, AFS, and pilots are all in agreement. Ted Thompson, Jeppesen, noted that database coding can only reflect one altitude per fix. Kevin recommended that both the ATC altitude and MCA altitude be charted, but only the "(MCA)" be put next to the appropriate altitude and not "(ATC)" next to the ATC altitude to save on chart clutter; however, there was no consensus on this recommendation. At this point in the discussion, Rich Boll, NBAA, introduced a new issue closely related to the issue under discussion - See Issue 08-01-280, which has been inserted below. As noted in the three examples in the issue paper there is a lack of standardization in depicting altitude restrictions. For example, the ZEFFER SID at Reno (KRNO) is depicted on the government charts with both MCA and ATC designations in accordance with Order 8260.46. However, the EDETH SID at Salt Lake City (KSLC), which also has obvious ATC and obstacle requirements, does not. Lastly, the GABRE SID at Los Angeles (KLAX) uses an MCA icon (flag) vice the "(MCA)" annotation. Rich also noted that the newly implemented RNAV SIDs at KSLC have experienced numerous altitude violations due to the use of "at or below" initial restrictions. As a result, KSLC TRACON began issuing a hard 10,000' initial altitude assignment concurrent with the initial ATC clearance. He added that lost communications instructions should be published on the KSLC RNAV SIDs because pilots complying with the initial 10,000' initial altitude assignment per Part 91.185 may lose obstacle clearance flying these SIDs in the event of lost comm. Rich closed by adding that there may be significant human factors issues associated with current practices. Ted Thompson, Jeppesen, stated that they had historically only charted one altitude; the one which matched the database coding. They are now charting dual altitudes when specified on the procedure source. Kevin stated that the publication of the obstruction clearance altitude is important knowledge for the pilot. He added there is no reason this safety information should only reside with ATC; providing the MCA altitudes to

pilots creates a good redundancy in the aviation system. This would be especially helpful if an aircraft lost communications when assigned an altitude lower than a published MCA. Dan Diggins, AJT-22, stated that it is common for controllers to take an aircraft off (both vertically and laterally) an assigned procedure. Rich interjected that when this happens ATC “owns” the aircraft. During the discussion, a suggestion was made that anytime ATC removes an aircraft from a SID they stay removed until in the en route structure. Bill noted that this was also suggested during the discussion of issue 90-02-103; however, ATC rejected this proposal. He then asked the status of the “climb via” phraseology issue. Paul Ewing, AJR-37 (AMTI), stated the issue is still being worked by the RNAV/RNP office. Rich proposed another possible way to handle this issue is to publish MOCAs on all segments of the SID. Brad Rush commented that MOCAs are currently only required on SID transitions. Jaques Beaudry, NAV Canada, pointed out the initial segment MOCA would be higher than the runway so the pilot would be in violation of the MOCA immediately after taking off. Tom confirmed that adding a MOCA along a route where an aircraft is climbing to achieve en route obstacle clearance is impractical and could cause pilot confusion. After much discussion, it was agreed to combine new issue 08-01-280 with this issue and form an ad-hoc working group to resolve all related DP issues to include: Order 8260.46 policy, ATC procedures, AIM revisions, graphic DP charting specifications, using “MCA” on SIDs vs. development of a new designation, etc. Tom Schneider agreed to chair the working group. A listing of those who signed up to participate in the DP working group is attached here .

Status: AFS-420 will chair an ad-hoc working group to address both issues and recommend resolutions. **Item Open - (AFS-420).**

Editor’s Note: *New issue 08-01-280, which is now included in this issue follows:*

GOVERNMENT/INDUSTRY AERONAUTICAL CHARTING FORUM
Instrument Procedures Group
April 22, 2008

RECOMMENDATION DOCUMENT

FAA Control # 08-01-280

Subject: Minimum Obstruction Clearance Altitudes Depicted on Standard Instrument Departures (SIDs)

Background/Discussion: FAA Order 8260.46C, Departure Procedure Program, paragraph 10(f)(1), Charting Minimum Altitudes, requires that SIDs (both conventional and RNAV) must depict minimum altitudes for obstruction clearance; and, where appropriate, any required minimum ATC altitudes. Where these differ, documentation of both minimum altitudes is required on the 8260-15 form. Appendix 5 (Non-RNAV DP's) and Appendix 6 (RNAV DP's) of this Order require that SIDs accommodate ATC and obstruction clearance requirements by documenting the ATC altitude followed by the altitude required for obstruction clearance. Charting agencies must depict the obstruction altitude as a minimum crossing altitude (MCA). An example of the application of this requirement may be seen on the attached ZEPHR THREE RNAV SID at Reno, NV (RNO).

Some recently published Graphic DP's fail to depict minimum obstruction clearance altitudes in accordance with the above stated requirements. Two examples of SIDs that do not comply are the EDETH ONE (RNAV) at Salt Lake City, UT (SLC) and the GABRE SIX at Los Angeles, CA (LAX), both of which are attached. Further, there are several other Graphic DPs currently in coordination that also fail to depict the minimum altitudes for obstruction clearance.

The failure to provide minimum altitudes for obstruction clearance on SIDs published at airports located in mountainous terrain, coupled with the absence of lost communication procedures on these same SIDs, creates a serious hazard to a departing aircraft whenever ATC intervenes with the published climb instructions and if communication with ATC is

subsequently lost. Without minimum obstruction clearance altitudes depicted on these Graphic DP's as required by 8260.46C, a pilot is unable to apply the requirements of 14 CFR 91.185 and 14 CFR 91.191 following loss of communication with ATC. This raises the very significant potential for a controlled flight into terrain (CFIT) event.

Further, without minimum altitudes for obstruction clearance published on the Graphic DP, a pilot is unable to apply the recently issued guidance contained in AIM 5-2-8 (e)(7):

7. If an altitude to "maintain" is restated, whether prior to or after departure, previously issued "ATC" altitude restrictions are cancelled. All minimum crossing altitudes which are not identified on the chart as ATC restrictions are still mandatory for obstacle clearance. If an assigned altitude will not allow the aircraft to cross a fix at the minimum crossing altitude, the pilot should request a higher altitude in time to climb to the crossing restriction or request an alternate routing. ATC altitude restrictions are only published on SIDs and are identified on the chart with "(ATC)" following the altitude. When an obstruction clearance minimum crossing altitude is also to be published at the same fix, it is identified by the term "(MCA)."

The above guidance was added to the 14 February 2008 edition of the AIM in response to ACF-IPG agenda item 07-01-274. The purpose of this change was to emphasize that an altitude restriction not identified on the chart as an ATC restriction is mandatory for obstruction clearance purposes. NBAA feels that this ACF-IPG agenda item cannot be closed until Graphic DP's properly depict minimum altitudes for obstruction clearance in accordance with 8260.46C.

Recommendations:

All Graphic DP's should be designed and charted in accordance with the criteria contained in FAA Order 8260.46C with respect to fix minimum altitudes for obstruction clearance (MCA) and for air traffic purposes (ATC). Further, the future revision to the 8260.46 Graphic DP's should require the charting of the applicable MOCA for all non-vector procedure legs.

An immediate review of all Graphic DP's published since the issuance of the "C" revision to the 8260.46 Order should be initiated to ensure that minimum crossing altitudes for obstruction clearance are properly charted. Priority should be given to SIDs established at airports located in designated mountainous terrain as specified in 14 CFR 95, Subpart B. Further, all Graphic DP's currently in coordination should also be reviewed for compliance with 8260.46C.

To ensure that controllers fully understand the design implications of altitude restrictions and climb gradients published on all DP's, both ODPs and SIDs, whether textually or graphically depicted, ATO-T should provide additional guidance through an appropriate means, i.e. Air Traffic Bulletin, Mandatory Briefing Item, and/or revision to the 7110.65 Handbook, regarding which altitude restrictions and/or climb gradients cannot be canceled or otherwise amended by the controller. This guidance should further advise that tactical intervention applied to departing aircraft should not unduly restrict the aircraft's ability to meet a climb gradient established for obstruction clearance, to achieve a (MCA) crossing altitude established for a fix, or the MOCA for a leg as published on the Graphic DP.

Comments: *This recommendation affects all Departure Procedures, especially SIDs that have both ATC and obstruction clearance requirements, developed in accordance with FAA Order 8260.46C & future revision and Air Traffic Organization's guidance to air traffic controllers.*

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(ZEFFR3.ZEFFF) 08045

ZEFFR THREE DEPARTURE (RNAV)

SL-346 (FAA)

RENO/TAHOE INTL (RNO)
RENO, NEVADA

ATIS 135.8 363.0
CLNC DEL
124.9 370.85
GND CON
121.9 348.6
RENO TOWER
118.7 257.8
RENO DEP CON
119.2 279.55

TAKE-OFF OBSTACLE NOTES

RWY 16L: Antenna, trees, and light poles beginning 618' from DER, 131' left of centerline, up to 40' AGL/4449' MSL.
Terrain beginning 5189' from DER, 821' left of centerline, up to 4939' MSL.

RWY 16R: Multiple trees beginning 746 feet from DER, 380' left of centerline, up to 49' AGL/4478' MSL.
Multiple trees beginning 2783' from DER, 171' right of centerline, up to 71' AGL/4510' MSL. Ground beginning 1.2 NM from DER, 777' left of centerline, up to 4703' MSL.

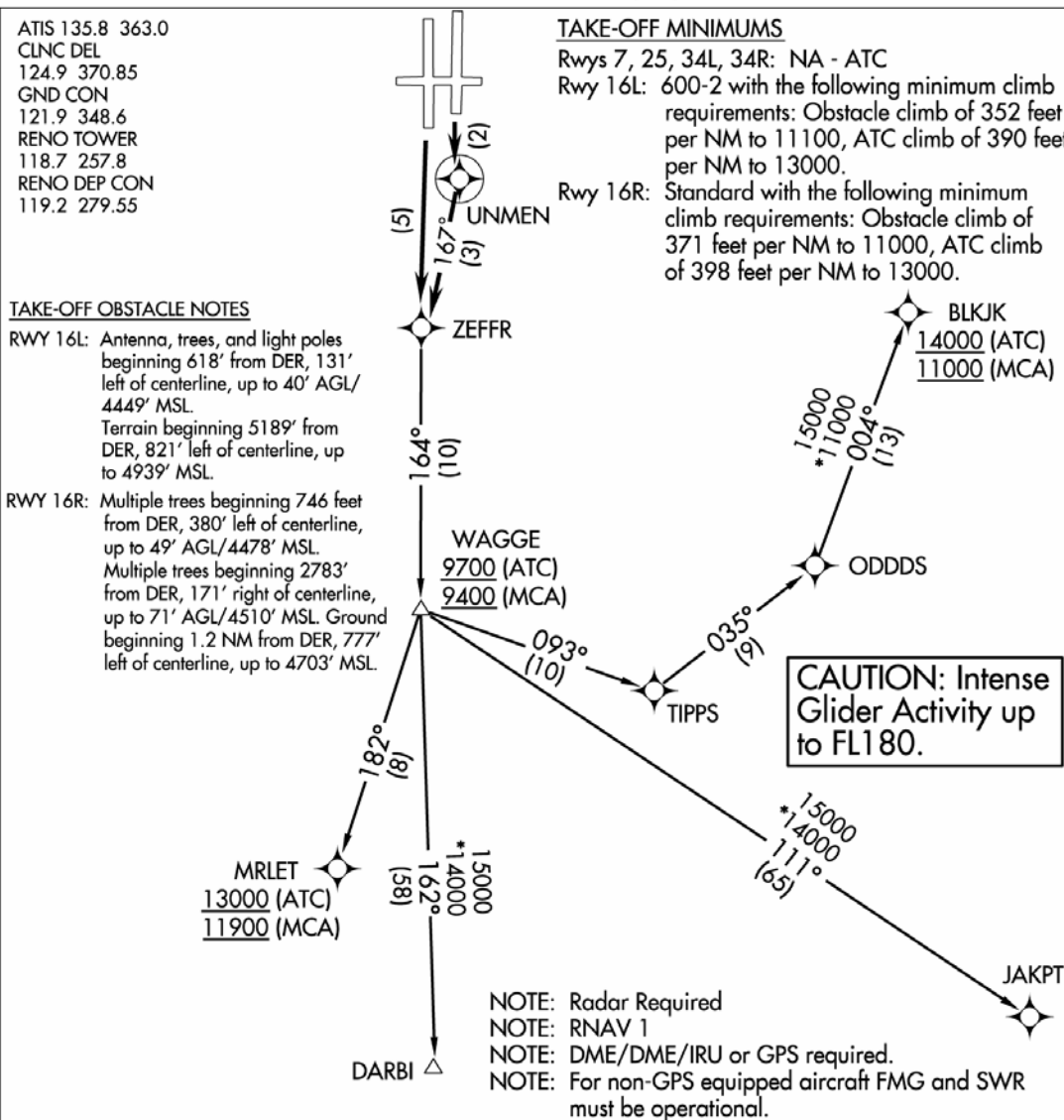
TAKE-OFF MINIMUMS

Rwys 7, 25, 34L, 34R: NA - ATC

Rwy 16L: 600-2 with the following minimum climb requirements: Obstacle climb of 352 feet per NM to 11100, ATC climb of 390 feet per NM to 13000.

Rwy 16R: Standard with the following minimum climb requirements: Obstacle climb of 371 feet per NM to 11000, ATC climb of 398 feet per NM to 13000.

SW-4, 14 FEB 2008 to 13 MAR 2008



NOTE: Chart not to scale.



DEPARTURE ROUTE DESCRIPTION

TAKE-OFF RUNWAY 16L: Climb direct UNMEN, then via 167° track to ZEFFR, Thence...

TAKE-OFF RUNWAY 16R: Climb direct ZEFFR, Thence...

....via (transition) or (assigned route). Maintain 15000. Expect clearance to filed altitude five minutes after departure.

BLKJK TRANSITION (ZEFFR3.BLKJK)

DARBI TRANSITION (ZEFFR3.DARBI)

JAKPT TRANSITION (ZEFFR3.JAKPT)

MRLET TRANSITION (ZEFFR3.MRLET)

ZEFFR THREE DEPARTURE (RNAV)

(ZEFFR3.ZEFFF) 08045

RENO, NEVADA
RENO/TAHOE INTL (RNO)

SW-4, 14 FEB 2008 to 13 MAR 2008

(EDETH1.EDETH) 07354

SL-365 (FAA)

SALT LAKE CITY INTL(SLC)
SALT LAKE CITY, UTAH

EDETH ONE DEPARTURE (RNAV)

ATIS 124.75 127.625

CLNC DEL

127.3 387.1

GND CON

121.9 348.6 (Rwys 14-32, 17-35)

133.65 348.6 (Rwys 16L-34R, 16R-34L)

SALT LAKE CITY TOWER

119.05 257.8 (Rwy 16L-34R)

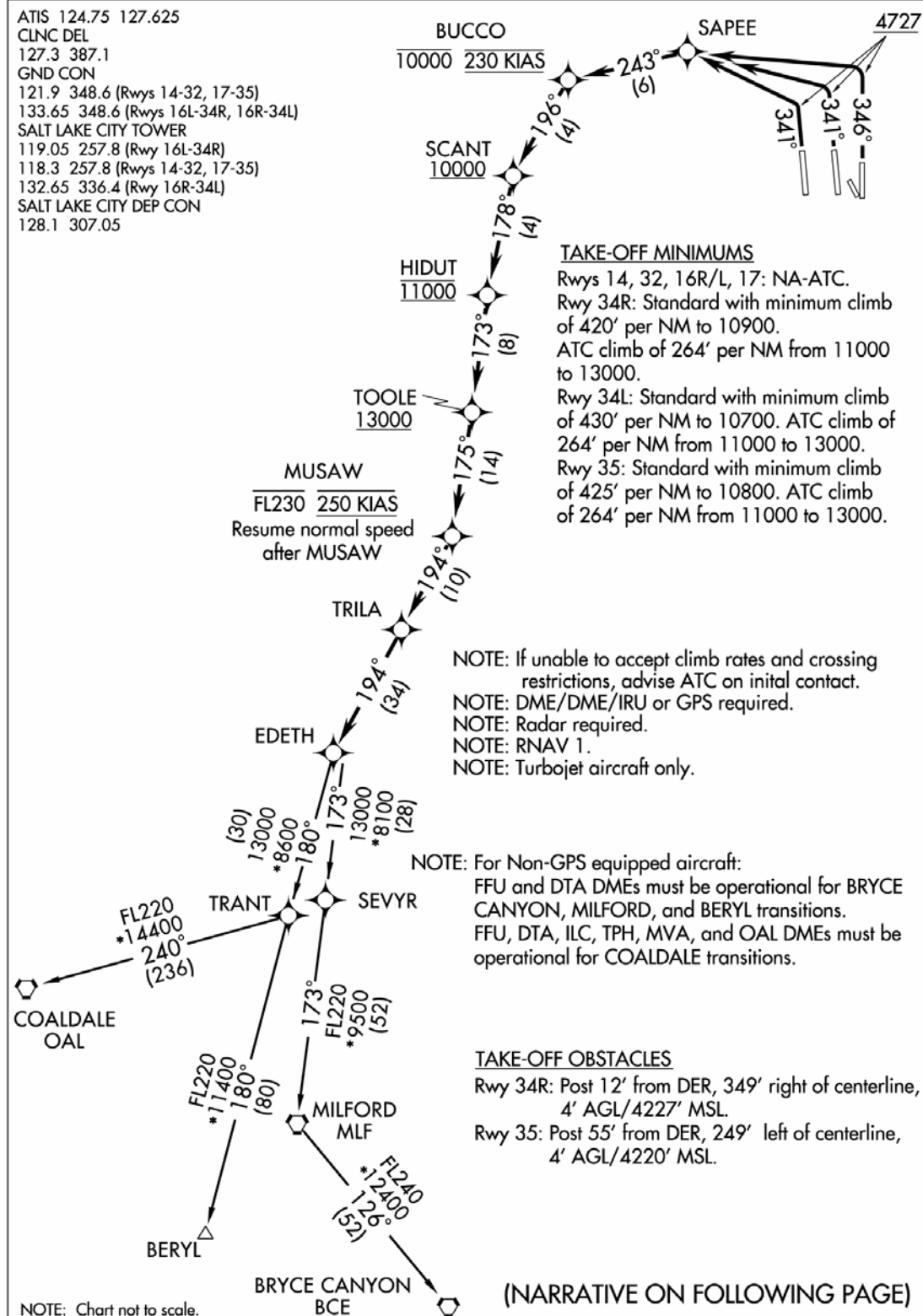
118.3 257.8 (Rwys 14-32, 17-35)

132.65 336.4 (Rwy 16R-34L)

SALT LAKE CITY DEP CON

128.1 307.05

SW-4, 13 MAR 2008 to 10 APR 2008



SW-4, 13 MAR 2008 to 10 APR 2008

EDETH ONE DEPARTURE (RNAV)
(EDETH1.EDETH) 07354

SALT LAKE CITY, UTAH
SALT LAKE CITY INTL (SLC)

(GABRE6.GABRE) 08101

GABRE SIX DEPARTURE

SL-237 (FAA)

LOS ANGELES INTL (LAX)
LOS ANGELES, CALIFORNIA

ATIS DEP 135.65

CLNC DEL

121.4 327.0

GND CON

N 121.65 327.0

S 121.75 327.0

LOS ANGELES TOWER

N 133.9 239.3

S 120.95 379.1

SOCAL DEP CON

125.2 385.4

DAGGETT
113.2 DAG
Chan 79
N34°57.75'-W116°34.69'
L-7, H-4

GABRE
N34°20.39'
W118°03.29'
11000

FOGEX
N34°28.12'
W117°33.75'

VAN NUYS
113.1 VNY
Chan 78

LOS ANGELES
113.6 LAX
Chan 83

SEAL BEACH
115.7 SLI
Chan 104

TAKE-OFF OBSTACLE NOTES

RWY 6L: Multiple signs and buildings beginning 1693' from DER, 340' left of centerline, up to 91' AGL/201' MSL.

RWY 6R: Obstruction light on sign, 1867' from DER, 941' left of centerline, 52' AGL/161' MSL. Multiple towers and windsock beginning 4930' from DER, 1734' right of centerline, up to 207' AGL/306' MSL.

RWY 7L: Multiple blast fences, signs, and antennas beginning 168' from DER, on centerline to 1858' from DER, 576' left of centerline up to 58' AGL/147' MSL. Railroad 275' from DER, up to 23' AGL/117' MSL.

RWY 7R: Multiple trees beginning 1273' from DER, 700' right of centerline up to 68' AGL/157' MSL. Building 791' from DER, 700' right of centerline, up to 32' AGL/130' MSL.

NOTE: Minimum climb of 397' per NM to 12000.

NOTE: Expect radar vectors to SLI R-345.

NOTE: RADAR Required.

NOTE: DME Required.

NOTE: RWY 24L/R, 25L/R NA - Air Traffic.

NOTE: Chart not to scale.



DEPARTURE ROUTE DESCRIPTION

TAKE-OFF RUNWAY 6L/R: Climb heading 070° until the LAX VORTAC 3 DME, then turn left heading 055° for vector to SLI R-345. Thence....

TAKE-OFF RUNWAY 7L/R: Climb heading 070° for vector to SLI R-345. Thence....

....via SLI R-345 to GABRE INT. Then via (transition) or (assigned route).

DAGGETT TRANSITION (GABRE6.DAG): From over GABRE INT via VNY R-057 and DAG R-224 to DAG VORTAC.

GABRE SIX DEPARTURE


(GABRE6.GABRE) 08101

LOS ANGELES, CALIFORNIA
LOS ANGELES INTL (LAX)

SW-3, 10 APR 2008 to 08 MAY 2008

SW-3, 10 APR 2008 to 08 MAY 2008

MEETING 08-02: Tom Schneider, AFS-420, briefed that as requested at the last meeting, he chaired an ad hoc DP working group that met via telcon on July 8, 2008 to discuss procedure source, charting and database coding when dual (ATC and MCA) altitudes are required at the same fix. After lengthy discussion the participants all agreed that the FAA procedure source (8260-Series Forms) will clearly indicate the purpose when dual restrictions are required at the same location. All agreed to retain and expand the use of existing policy in FAA Order 8260.46C, Appendices 5 and 6, which requires that when 2 altitudes are necessary (support both an ATC altitude and a Minimum Crossing Altitude (MCA)), the “(ATC)” and “(MCA)” suffix icons be placed adjacent to the altitude on the procedure source and charted accordingly. In situations where only a single altitude is necessary (lowest altitude available that supports obstacle clearance, NAVAID and/or Communications reception, and/or airspace requirements), the “(MCA)” suffix icon(s) will not be published. This methodology would not require any changes to existing charts published with only the one altitude at a fix. It will; however, require a change to Order 7110.65 and training to ensure controllers are aware that published altitude restrictions which are not specifically labeled as (ATC) are mandatory and cannot be canceled. It will also require ATC facilities to review all their SIDs to insure altitude restrictions are properly defined by determining if they are there for ATC purposes or for other procedure design requirements. Once that has been determined, the procedure may require revision to come into compliance with the current standards and criteria. Order 8260.46D, which is currently under revision will provide expanded guidance. During the discussions, the question was brought up as to which altitude should be coded into the avionics database when there are 2 altitudes at the fix (ATC and MCA). It was agreed that the higher (“(ATC)”) altitude value should be coded because this is what is expected to be flown all the time. If ATC were to delete the ATC altitude restriction, the pilot can then cross no lower than the charted “(MCA)” altitude at that fix. This would require manual intervention to select the lower altitude if the avionics system supports both altitudes in the database, or the pilot must comply with the altitude manually. A follow-on DP working group meeting is planned to finalize any outstanding issues. AFS-420 will revise policy and documentation requirements in Order 8260.46D. **ACTION: AFS-420.**

MEETING 09-01: Tom Schneider, AFS-420, briefed that after the last meeting, the ad hoc DP working group met via telcon in Dec, Feb and Mar. A copy of the meeting minutes was included in the meeting handout material and is included here  The ad-hoc group consensus is that ATC altitude restrictions on SIDs will be annotated “(ATC)”. Other altitude restrictions that are required for obstacle clearance or procedure design will not be annotated. It was agreed that anytime an ATC restriction is published, a second altitude will also be published to provide pilots awareness of what altitude restrictions must be complied with when ATC lifts an “(ATC)” crossing restriction. Mike McGinnis, APA, asked whether there is a time limit for ATC facilities to review SIDs to determine which currently published minimum altitudes are for ATC. Tom responded that the guidance is not final yet as formal coordination must be accomplished. Valerie Watson, AJW-352, stated that she has been coordinating the IACC spec change and has concurrence from Jim Arrighi, AJR-37, to apply the same standard to Standard Terminal Arrivals (STARs). Dan Diggins, AJT-22, asked if there is a SID review requirement. Tom responded that Order 8260.19 requires a biennial review of all instrument flight procedures. AFS-420 will revise policy and documentation requirements during the re-write of Order 8260.46D. **ACTION: AFS-420.**

MEETING 09-02: Tom Schneider, AFS-420, briefed that policy revisions recommended by the ad-hoc DP Working Group have been made to Order 8260.46D and the AIM. The changes were published on August 27. Gary Fiske, AJT-28 stated that corresponding changes to JO 7110.65 have been coordinated and will be published on February 11, 2010. Tom recommended the issue be closed and the Group concurred. **ITEM CLOSED**.
